HOUSEHOLD CALENDAR

Behind the Scenes in the Textile Laboratories

A radio interview between Miss Ruth Van Deman, Bureau of Home Economics, and Morse Salisbury, Office of Information, broadcast Thursday, September 16, 1937, in the Department of Agriculture period, National Farm and Home Hour.

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SALISBURY:
Again your regular Thursday reporters -- Ruth Van Deman and Roy F. Hendrickson -- are on hand to give you news of their particular bailiwicks in the Department of Agriculture. Ruth, I don't know whether it's the effect of this fine September weather we're having or of that hat you're wearing, but you certainly have the air of somebody about to go places.

VAN DEMAN:
Of course. I'm always ready to go places, and see things. And, Morse, I hope you're in a sightseeing mood yourself today.

SALISBURY:
What good would it do me. No vacation for me this year.

VAN DEMAN:
And mine all over. But this trip won't take us out of Washington. Won't involve any passports, or railroad tickets, or even gasoline.

SALISBURY:
Which listens very good to the ears of my pocketbook.

VAN DEMAN:
It should. A no expense tour, personally conducted. I'll even guarantee the weather, at least on the first stop. All you need for this tour is a fund of scientific curiosity.

SALISBURY:
Ruth, sign me on. Let's go.

VAN DEMAN:
All right. We'll head for the textile laboratories in the South Building of Agriculture, to have a quick look around at the machines and methods they use in serviceability tests of fabrics.

SALISBURY:
O.K. I'm right with you. What's this?

VAN DEMAN:
This is the constant-temperature-humidity room.

SALISBURY:
Constant temperature. Now I see why you could guarantee the weather.

(over)

MISS VAN DEMAN:
Yes. The temperature in this room doesn't change day or night. It stays right on the dot of 70 degrees with 65 percent humidity.

MR. SALISBURY:
It must be a pretty nice place to work in.

MISS VAN DEMAN:
Yes, but a little on the cool side for me. I had to put on a sweater yesterday when I went in to interview Margaret Hays. And I noticed that the girl who was running samples of fabrics through the tensile strength machine was wearing a smock over her laboratory uniform.

MR. SALISBURY:
What is the idea of a constant-temperature-humidity room for this textile work.

MISS VAN DEMAN:
It's necessary in order to get comparable results on a series of fabrics. All textile fibers and fabrics are constantly taking up moisture from the air or drying out. You know how heavy and damp your clothes feel on a foggy, rainy, morning, especially if they've been near an open window.

MR. SALISBURY:
Yes.

MISS VAN DEMAN:
And how much more wrinkled they get when you pack them on a damp day than when the weather's dry and clear.

MR. SALISBURY:
Yes, certainly.

MISS VAN DEMAN:
Well, those changing amounts of moisture in textile fibers make other differences you can't see. They influence the breaking strength, and the amount of rubbing fabrics can stand, and the amount of air they will or will not allow to pass through. So when you're giving one fabric after another mechanical tests that duplicate in a scientific way the wear and tear we give our clothes and household textiles, you have to conduct those tests in a room where you know exactly what the temperature and humidity are, and where you can keep them constant.

MR. SALISBURY:
Ruth, you've certainly made the reason for the constant-temperature room clear. Now tell me the principle of that tensile strength machine the girl in the smock is operating.

MISS VAN DEMAN:
A tensile strength machine is a great big affair. About six feet high with a lot of perpendicular steel rods and bars, and in the middle of them a rather inconspicuous pair of steel jaws. But watch those jaws. We're going to test a piece of cloth. We fasten it into the jaws. Then we start the electric motor. See that pointer on the big dial at the top? Well, it's recording how many pounds it takes to break this strip of cloth.

SALISBURY:
Took 79 pounds to break that piece of heavy muslin sheeting.

VAN DEMAN:
That was warpwise. We always test fabrics two ways -- warpwise and fillingwise. And by the way, if you ever happen to be reading the breaking strength figures on a fabric label, notice whether they're taken by the strip or the grab method. A tensile strength machine has a pair of jaws for each of those methods. And the grab method gives consistently higher values.

SALISBURY:
All right. I'll watch that. And tell me this, are bursting strength and breaking strength the same thing?

VAN DEMAN:
They are not. They're measured on the same machine, but by different attachments.

SALISBURY:
Very well. Show me how you measure the bursting strength of a piece of cotton broadcloth.

VAN DEMAN:
We imitate the way your elbow might poke through a tight shirt sleeve. We fit the machine with a device that pulls the broadcloth tight over a steel ball. As the pressure increases, the broadcloth finally gives way in a three-cornered hole, just as it would in your shirt. The dial shows a reading in number of pounds. And that reading is what you call the bursting strength.

SALISBURY:
So you can compare the strength of different shirt fabrics.

VAN DEMAN:
Yes, broadcloth for shirts, or muslin for sheets, or turkish toweling for bath towels- whatever kind of fabric you want to test. Well, Morse, when we started this tour I didn't think we'd linger quite so long by the tensile strength machine. Margaret Hays says that most people who come into her lab find this abrasion machine the most interesting.

SALISBURY:
I shouldn't wonder. I'm curious myself to know how the abrasion machine goes about abrading. (I guess abrade is the right word isn't it?)

VAN DEMAN:
Yes, abrade, rub, wear out by friction - they all mean the same thing. Well, this abrasion machine has a set of four arms. You clamp samples of fabrics to these arms. Then they're lowered and fastened against a drum of steel gauze. A motor keeps this steel drum moving and rubbing the fabrics for a certain length of time. And that way you find how they rate one with another in their ability to withstand rubbing. We've been using this machine lately on upholstery fabrics.

SALISBURY:
I wish I'd known whether the chair covers at home had been put to a test like that. Maybe we could have picked some that would have held up better

VAN DEMAN:

Maybe so. We're working toward buying guides on upholstery fabrics. We hope to set up specifications for two grades of friezes and some rib weaves and damasks. Now, Morse, I know we've got to be moving along on our tour, but I want you to have a look at this air permeability machine. Miss Hays uses this and the heat transmission machine on blanket and playsuit fabrics to get an idea of their warmth.

SALISBURY:

I see, to find out how much cold air they will keep out and how much warmth they can be counted on to keep in.

VAN DEMAN:

That's it in a nutshell, Morse. The air permeability machine is run somewhat on the vacuum cleaner principle. See, it's a long suction tube with the piece of the cloth to be tested fastened at one end and a fan at the other end to pull the air through. Inside is a device to measure the air flow. That's putting it very roughly of course. But if you were testing a lot of blankets, it would enable you to spot the ones that would let through the most air and those that would let through the least air.

SALISBURY:

Maybe it would help a person to tell which blankets would be good to take to camp.

VAN DEMAN:

Yes, or to use on the sleeping porch. Anywhere you're trying to keep very cold air from penetrating to your body and chilling it.

There are a number of other interesting pieces of apparatus in this constant-temperature room, but we'll have to skip them today. I want you to step across the hall with me to the textile chemistry laboratories Ruth Elmquist presides over.

SALISBURY:

Is this the place they do some of that fiber identification work the club women and consumer groups are talking about?

VAN DEMAN:

Some. But their main object is to get manufacturers to label their goods with the kind of fibers it contains.

Ruth Elmquist's work over in this laboratory is more to measure the tendering and chemical deterioration of cotton and wool fabrics from the time they're new until they're worn out. You know in addition to the kind of wear on a fabric that you can see and feel and spot by mechanical tests, such as we've been talking about, there are chemical changes constantly going on in the textile fibers. They come as the result of washing and ironing, and weathering, and even ageing, when fabrics lie unused on a shelf. You remember we made these chemical tests every so often on the sheets we had woven from different grades of cotton and put into actual use in a hotel.

SALISBURY:

Yes, you've told us about those tests on fabrics made from different grades of cotton and wool. I get the general idea. But when it comes down to the fine points, I haven't any idea what chemical tests of that kind involve.

VAN DEMAN:

They're very technical. One is called the cupramonium test. Another the copper number test, and another the methylene blue test. The last one's the most picturesque.

SALISBURY:

Well, let's see it.

VAN DEMAN:

O.K. I'll demonstrate as though I were a real chemist. First I'll shred the cotton fabric up into little strips. Then I'll soak it overnight in a bath of this methylene blue dye held at a certain temperature. The next morning I'll measure in a very exact way the amount of dye the fabric has absorbed. That will tell me the extent to which the cotton fibers have been damaged. You see the more dye the cotton absorbs the more damaged the fibers are. And as I said a moment ago that damage comes from laundering, and ageing, and various other causes.

SALISBURY:

Well, Ruth, all this is very very interesting. It gives me a better picture than I ever had before of the research behind those buying guides for sheets, blankets, and towels that your bureau publishes. By the way is that buying guide bulletin still on the free list?

VAN DEMAN:

As far as I know. The exact title you remember is "Guides for buying sheets, blankets, and bath towels." Yes, the facts in that bulletin have been built up bit by bit from tests on the different fabrics in the humidity room and the chemistry lab, plus a study of the goods and labels in the stores.

We're gradually getting a scientific basis for selecting textiles to suit our personal and household needs. Some day we may be able to make as definite recommendation on textiles as we now can on food and diet, though the connection with health isn't so close.

SALISBURY:

But this scientifically curious tourist finds the connection with the pocketbook quite close. I suppose that's why the Congress directed the Bureau of Home Economics to do this textile research. As we've said it already has produced practical results in the form of several buying guides for the use of consumers. The previous work carried on by people we've seen on today's tour is back of that bulletin, "Buying Guides for Sheets, Blankets, and Bath Towels." If any of you listening wish the bulletin, send your request to the U. S. Department of Agriculture, Washington, D. C.

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